

REMARKS

The present filing is responsive to the Office Action.

Summary of the Response

The specification has been amended. Claims 27, 32, 33 and 51 have been amended. Claim 31 was previously canceled, and claim 38 is now canceled. Claims 27-30, 32-37 and 39-52 remain pending in this application. Reexamination and reconsideration of the present application as amended are respectfully requested.

Telephone Interview

Applicant is grateful for the courtesy extended by the Examiner for the opportunity of an Examiner Interview by telephone on January 24, 2008. The parties discussed the cited prior art and the claims, in reference to a dome-shaped recess in convex structures/protrusions. While no agreement has been reached, the Examiner preliminarily indicated that a convex structure/protrusion having a dome-shaped recess is not disclosed in any of the cited references when viewed singly. The Examiner requires additional opportunity to consider Applicant's arguments more fully presented in a written response, and further consideration of additional relevant references. The Examiner agreed that reference to dome-shaped recess would not be deemed new subject matter, as dome-shaped recess is clearly shown in the figures. The dome-shaped recess in convex structure will be addressed in detail below.

Summary of the Invention

In Applicant's earlier responses, Applicant noted that the light coupling structure of the present invention is structured to work with a two-dimensional (i.e., planar) array of point light sources at one planar surface of the light guide plate. This particular type of light guide is distinguished from the edge-lit type of light guide, for which a linear light source is provided at the edge of the light guide plate. Edge-lit type light guide is designed for use to reduce the overall thickness of the backlight module, because there are no light sources provided on the planar side of the backlight module. However, the two-dimensional planar area of point light sources provide relatively brighter and more even distribution of light for the backlight module, as compared to an edge-lit backlight module in which light has to make its way from the side light source, to be distributed across the top light emitting planar surface. In order to improve even distribution of light over the planar output surface of an edge-lit light guide plate, it is designed to reflect and scatter light from the planar surfaces in the viewing path of the illuminated object. As such, the design considerations of an edge-lit light guide plate are different from the design considerations of a backlit in many respects.

The inventive light coupling structure comprises a two-dimensional array of protruding or convex structures that extend from a planar surface of the light guide plate, wherein each convex structure is aligned with a point light source (i.e., a two dimensional array of point light sources). The protrusion or convex structure has a dome-shaped recess within the convex structure, which dome-shaped recess is directly facing a point light source. Light emitted from the point light source is substantially received by the dome-shaped recess and through the convex structure. The convex structures having the dome-shaped recess more effectively diffuse the light from the point light source into the light guide plate, to achieve a more uniform light distribution across the entire light emitting surface of the light guide plate.

Claim Rejections Under 35 USC 103

Claims 27-30, 32-37, 39-45 and 48-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harbers et al. (Harbers, previously cited), US Publication No. 2005/0073495, in view of Kitamura, Japanese Laid-Open Patent Application No. 2004-047297 (previously cited). Claim 38 is rejected over Kitamura in view of Harbers, as applied to claim 27 above, and further in view of Koike et al. (Koike), US Patent No. 5,528,709. Claims 46 and 47 are rejected over Kitamura in view of Harbers, as applied to claim 27 above, and further in view of Nishio et al. (Nishio, previously cited), US Patent No. 5,598,280. These rejections are respectfully traversed.

Independent claims 27 and 51 have been amended to specifically recite dome-shaped recess in the convex structures/protrusions. The cited references do not render obvious these claims as amended.

The Examiner conceded that Harbers fails to disclose a two dimensional array of convex structures/protrusions. The Examiner further conceded that the combination of Harbers and Kitamura fails to teach the convex structures/protrusions to disclose the recess to be an arc-shaped recess (as recited in previously presented claim 38). The Examiner then turned to Koike for the missing teaching. Given the amendment of claims 27 and 51 to include dome-shaped recess, the combination of references including Koike will be addressed below.

Koike does not make up for the deficiencies of Harbers and Kitamura. As the Examiner acknowledged during the interview, Koike does not disclose dome-shaped recesses. Instead, Koike discloses cylindrical shaped recesses 1B (i.e., a recess having a cylindrical axis perpendicular to the plane of the Koike light guide 1, as shown in Fig. 5B in Koike).

Accordingly, even if Harbers, Kitamura and Koike can somehow combined in the manner proposed by the Examiner, such combination would not obtain the claimed invention, which require dome-shaped recesses.

Applicant respectfully submits that there is no teaching, suggestion, motivation, or any apparent reason to combine Harbers, Kitamura and Koike in the first place. Koike (like some of the references earlier cited by the Examiner and overcome by Applicant in the pre-Appeal process) is not directed to a light guide structure for a two-dimensional array of point light sources. Koike is instead directed to an edge-lit type backlight module in which light has to make its way from light sources on the corners of the light guide, to be distributed across the light guide. The design consideration of such edge-lit type light guide module is very different to a backlight type light guide like the present invention. The light source in Koike is not on the planar side (versus the corners) of the light guide. The light entering the corners of the light guide is spread across the plane of the light guide.

Applicant submits that the light diffusion effect of a backlight type light guide and an edge-lit type light guide is quite different. For a backlight type light guide that employs a two-dimensional array of point light sources, such as LEDs, against a light receiving surface of the light guide plate. The light from each point light source is diffused in symmetrically about the light-axis (i.e., about the axis perpendicular to the light source, which is perpendicular to the plane of the array of light sources and the light guide plate). In particular for the present invention, light emitted from the point light source is substantially received by the dome-shaped recess and through the convex structure. The convex structures having the dome-shaped recess more effectively diffuse the light from the point light source into the light guide plate, to project

symmetrical diffused spots that overlap to achieve a more uniform light distribution across the entire light emitting surface of the light guide plate.

In contrast, for the edge-lit type light guide of Koike with lights at the corners of the light guide, light has to make its way from the corner light sources, to be diffused across plane of the planar light guide. Koike provides a cylindrical-shaped recess (having a cylindrical axis perpendicular to the plane of the light guide) at each corner of the light guide. These recesses at most facilitate, if at all, the spreading of light along and across the plane of the light guide, in a divergent manner from each corner. For example, referring to Fig. 5B in Koike, the LED 3 interacts with the cylindrical-shaped recess 1B to spread light at a divergent manner from the corner, to cover a quadrant (90-degree) in the plane of the light guide. Accordingly, it can be seen that the design objective in Koike would be to more uniformly diffuse light from the corner LEDs across and along the plane of the light guide. This is different from diffusing symmetrical diffused spots of light from an array of point light source in accordance with the present invention.

There is therefore no teaching, suggestion, motivation or apparent reason which can be gleaned from Harbers, Kitamura and Koike, or any other references for that matter, to modify the rear-lit light guide in Harbers to have light guide blocks in Kitamura, and then to further modify the Kitamura light guide blocks in such modified structure to have dome-shaped recess by reference to the edge-lit type light guide of Koike. Even if such series of modifications can somehow be accomplished as proposed by the Examiner, it is unclear if such final structure would have practical utility.

Further, Kitamura uses light guide blocks 11 that have a through-holes 12 extending through the entire length of the guide blocks. It is clear that Kitamura intended to achieve a

particular light diffusion effect using such through-hole structure in the guide blocks. Given that Kitamura specifically requires such through-hole structure, Kitamura effectively teaches away from using a recess having a curved bottom. Therefore, there is no suggestion of the desirability to modify Kitamura with the cylindrical-shaped recess structure of Koike to obtain the recited dome-shaped recess.

In accordance with MPEP §2143.01, the combination proposed by the Examiner cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. The proper test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art, and all teachings in the prior art must be considered to the extent that they are in analogous arts. Where the teachings of two or more prior art references conflict, the examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another.

Further, according to MPEP §2145 X.D.3, the totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of nonobviousness. It would be necessary to make modifications, not taught in the prior art, in order to combine the references in the manner suggested only by the Examiner. Further, the combination suggested only by the Examiner requires a progress series of many separate modifications that are too awkward to be

considered obvious to combine such. The references hence effectively teach away from each other, and hence it would not be logical to combine them. More particularly, the references themselves teach away (expressly or by implication) from the various and progressive combinations suggested by the Examiner to obtain the inventive structure. Since the references effectively teach away from each other, it would not be logical to combine any of them, much less to modify Harbers in view of Kitamura and Koike in the manner suggested by the Examiner. According to MPEP §2145 X.D.2, it is improper to combine references where the references teach away from their combination.

Accordingly, the references themselves do not teach, suggest, motivate or provide an apparent reason for, and in fact teach or suggest against, the combination proposed by the Examiner. Suggestion of the prior art is missing in relation to the present invention. Absent such suggestion, there is nothing that could naturally flow from the prior art, but instead must require non-obvious inventive steps leading to the present invention. The Examiner should refrain from relying upon cherry picking individual structures in the cited references to create the present invention based on impermissible hindsight reconstruction, completely disregarding the fact that the references themselves do not teach or suggest, and in fact teach or suggest against, the combination proposed by the Examiner.

Given the patentability of amended independent claims 27 and 51, all the dependent claims are likewise patentable over Harbers, Kitamura and Koike.

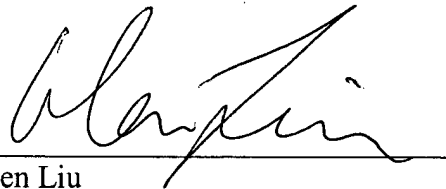
CONCLUSION

In view of all the foregoing, Applicants respectfully submit that the claims pending in this application are patentable over the references of record and are in condition for allowance. Such action at an early date is earnestly solicited. **The Examiner is invited to call the undersigned representative to discuss any outstanding issues that may not have been adequately addressed in this response.**

The Assistant Commissioner is hereby authorized to charge any additional fees under 37 C.F.R. §§ 1.16 and 1.17 that may be required by this transmittal and associated documents, or to credit any overpayment to **Deposit Account No. 501288** referencing the attorney docket number of this application.

Respectfully submitted,

Dated: February 5, 2008



Wen Liu
Registration No. 32,822

LIU & LIU
444 S. Flower Street; Suite 1750
Los Angeles, California 90071
Telephone: (213) 830-5743
Facsimile: (213) 830-5741
Email: wliu@liulaw.com